MTM

THE JOURNAL OF METHODS-TIME MEASUREMENT

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Vol. I

No. 3

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Second Report on Application Techniques from the Textile Industry - Lancashire, England

Photos Aid in Understanding Methods-Time Measurement

What Management Wanted from MTM

Inspection and Packing Analysis

President's Report - Montreal Chapter

MTM ASSOCIATION FOR STANDARDS AND RESEARCH

The Journal of Methods-Time Measurement is dedicated to the technical aspects, application developments and general news items concerning the advancement of MTM.

The Journal encompasses the fields of endeavor that were formerly publicized in the MTM Newsletter and MTM Bulletin.

The technical section of the Journal is concerned chiefly with recent research developments both from the established research program at the University of Michigan, Ann Arbor, Michigan, and from somewhat smaller allied projects being conducted throughout the Association membership.

New applications of MTM as well as refinements of established applications are presented in the Application Section to illustrate specific approaches to management problems that can be solved through the use of Methods-Time Measurement.

Current events in the lives of persons associated with MTM are described in the general news section.

The Editorial Staff welcomes contributions for all three sections described.

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MTM

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MTM ASSOCIATION FOR STANDARDS AND RESEARCH

THE JOURNAL OF METHODS-TIME MEASUREMENT

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Editor's Note:

The Association has tried in every way possible to check the veracity of material published in the Journal of Methods Time Measurement. However, the opinions of the authors are not necessarily the opinions of the Association. The Association, therefore, will not be held responsible for any liability which may develop from any material in this publication.

A WORD OF THANKS

The Association wishes to express its appreciation to committee members and the member organizations sponsoring these persons for their service on Association committees.

These committees are exceedingly important. The members have unselfishly devoted considerable time and study in formulating the sound practices and policies of the Association. They have expended unknown hundreds of man-hours of time to attend the many meetings—without compensation or travel expense. The reports and recommendations of the committees have been almost universally and completely adopted to provide the Association with rules and regulations of the highest principles and ethics. None of the officers or committee members receive compensation. All travel expense and time for meetings is donated by the sponsoring member.

The Association can well be proud of these men whose beliefs in the aims of the Association are in great part responsible for its growth and recognition.

Seth L. Winslow, President
MTM Association

TECHNICAL

SECOND REPORT ON THE APPLICATION OF THE MTM TECHNIQUE TO HOLTS FOSTER CONE WINDING MACHINES

From the Textile Industry in Lancashire, England

Bernard Crossley — Productivity Dept., Cotton Board. Manchester, England

INTRODUCTION

On the 8th December, 1953, a report was published showing the results of an investigation on the Holts Foster Cone Winder. On the 15th January, 1954, it was decided to carry out an experiment to show that the best method described in the first report could be successfully applied to Mill D which had a method having a longer motion path, and a higher time value. This second report describes the results. It is divided into five parts as follows:

A. Conclusions.
B. Conditions at Mill D.
C. Action taken.
D. Results.
E. Comment.

A. CONCLUSIONS

1. MTM can be used to define the best standard method of operating a particular type of machine.

2. A detailed analysis of each motion pattern in a series of operations isolates the variable and constant parts of a work element. This procedure ensures that a more accurate value can be established by comparing total basic motion times with overall times recorded by stop watch.

3. It has been shown that it is quite practicable and easy to reduce the length of the motion path for the creeling element at Mill D and thus reduce the time to compare with the established value at Mill E.

4. At Mill D the management were able to increase the number of drums per winder, and the production, without increasing the work load.

5. To gain any benefits from a refined analysis of basic motions in repetitive elements of work in a mill or department which has been work-studied requires the use of the MTM technique.

6. The use of the MTM technique should enable new applications of work study methods to be made more effectively than in the past, because the work study officer would be able to make a refined analysis of basic motions before timing the operatives with a stop watch.

B. CONDITIONS AT MILL D

The experiment at Mill D commenced on the 8th February 1954. Since the date of the original investigation the M86 machine with its box in front of the ring tube holders had been moved to another room and set up without its box. The operatives had also been moved. The table below gives the conditions during the first investigation and the conditions on 8th February.

Description	Before 8th Feb. 1954 Orig. Investigation	On 8th Feb. 1954 2nd Investigation
Average winding speed	400 yds/min.	450 yds/min.
Average count	24s	17½s
Drums per operator	22	22

The operative who had been studied during the first investigation was earning average wages for a production of 1,200 lbs. per week from 22 drums.

C. ACTION TAKEN

Three fibre boxes were placed under one operative's share of drums, and the operative was shown how to creel up according to the method used at Mill E.

A tray was designed to fit the end five drums in front of the tube holders, and the operative was shown how to creel up according to the synthetic motion pattern described in the first report.

D. RESULTS

After one week it was decided to discard the tray for the following reasons.

Advantages of tray compared with shelf

A shorter motion path (125 units less than creeling from a tray).

Disadvantages of tray compared with shelf

1. Fibre dust collects on the back of the shield fixed to the tray. This would mean more frequent dusting as compared with shelf.

Dirt would collect on running ends — a point which affects quality.

2. The operative found the tray in the way. This objection also applies to a box in front of the tube holders.

3. The tubes on the shelf are at eye level and the operative begins to scan for the end before grasping. The operative cannot do this when taking a tube from the tray, but must raise the tube to body level before looking for the end. (This condition is worse when picking up tubes by bending to a box.)

After the tray was discarded we concentrated on showing the operative the shortest motion path from the shelf. The following difficulties were overcome.

(a) The operative had difficulty at first in remembering not to take more than one empty tube from a holder at one occasion. This was overcome with practice and by supervision at the frame.

(b) The operative had difficulty at first in remembering to use the left hand for picking a tube from the tray, the tendency being to use the right hand. (When the right hand is used two transfer grasps take place at 64 units instead of one transfer grasp at 34 units. This is a very small detail but the operation of loading tubes and knotting to cone forms in this particular case 70% of the total work load.)

We were not successful in teaching the operative to pick off the end from the cone with the left hand. After a fortnight she insisted that it was just as quick to find the end with the right hand, so we allowed her to do this. As she never stroked the end from the cone (this takes the longest time) we were not worried about the effect on the time. This is not a criticism of the method, but a confession of failure to train an experienced winder to change long established habits.

This difficulty of re-training experienced operatives to work to a standard method is a subject and problem for special consideration in the future. New and inexperienced operatives can be very quickly trained in standard methods if the executive in charge of training uses the MTM technique.

The following table shows the production expected and production achieved, etc., at the present time, as compared with conditions on 8th February.

Description	8th Feb.		22 March		% Increased
Average winding speed	450 yds./min.		450 yds./min.		
Counts on ring tube	17½ s		17½ s		
Breakage rate	3.5/drum/hour		3.5/drum/hour		
	N.Ms.	S.Ms.	N.Ms.	S.Ms.	
Load creel value	.250	.280	.214	.240	-14
Piece break value	.187	.210	.187	.210	
Doff cone value	.280	.314	.280	.314	
Drums:	22		24		+ 9
Hours running from 45 hours	41½		41½		
Production for target wages	1320		1450		+10
Work load in standard minutes	2550		2550		
Actual production achieved @ average earnings*	1200*		1308*		+ 9

*These productions have been achieved in both cases during a period when the operative earned average earnings, i.e., there was no monetary incentive to achieve a higher production. It is expected that the production of 1450 lbs. will be obtained when the trial period ends and the operative works for incentive rates of pay.

The value at Mill E is .20 N.Ms but extra time had to be allowed at Mill D for removing end from tube, because the end is sometimes fast on the base of the tube.

E. COMMENT

This experiment has shown that a more careful analysis of operatives' movements before applying incentives will enable the work study officer to standardise and improve the method of working. Increased production from an established work studied set-up can only be obtained by careful analysis of all the factors which effect the operatives' productivity. The use of MTM will clearly show all the advantages and disadvantages of one method compared with another. The greatest benefits can be obtained where new applications are made. It should be possible to lay down the best standard method of operating all types of machines in the spinning and weaving industry in relation to the types and qualities of cotton being spun or woven. With a sufficient number of trained methods engineers in the industry it would be possible to concentrate on this problem and as a long term policy it would pay for itself. The technique is not difficult to learn.

Expensive equipment is not required, and provided that the person using MTM has sound practical experience in work measurement the technique will prove to be useful and valuable to all work study officers in textiles.

PHOTOS AID IN UNDERSTANDING METHODS TIME MEASUREMENT

B. E. Alberty and F. J. Day, Instructors in the Evening Division of Rochester Institute of Technology, Rochester, New York

Methods time measurement is finding increased use as a tool for the Industrial Engineer. The system fundamentally consists of an analysis of motions performed, followed by assignment of a time value to each motion. The time value assignment is simple and methodical. However, proper recognition of the motion performed can be quite difficult.

Lack of confidence and acceptance of methods time measurement can invariably be traced to the method of teaching or to the lack of visual aids in putting the system across. If the photographic techniques outlined in this article are used, results will be definitely more satisfactory. These are simple and inexpensive methods, and they produce confidence, clearer understanding, and consistency in application.

The fundamental problem in understanding methods time measurement is learning a set of general written definitions and applying them accurately to motions observed. But learning only definitions without full understanding of their meaning is as difficult as trying simply to memorize a geometric theorem or a law of physics and intelligently applying it. However, there is a definite aid to better understanding the definitions of methods time measurement. It is to transfer the motion into a static condition with still photography. The camera permits studying all of a particular motions

Side view of equipment in position.

REACH CASE A - 18 inches. Time 12.3 TMU (1 TMU = .00001 hr.) Reach to an object in fixed location with very little conscious direction.

REACH CASE B - 18 inches. Time 17.2 (TMU = .00001 hr.) - Reach to an object which varies slightly from cycle to cycle in location and requires a certain amount of conscious direction.

REACH CASE C - 18 inches. Time 18.4 TMU (1 TMU = .00001 hrs.) - Reach to an object jumbled with other objects in a group so that search and select occur in order to make a selection.

phase at one time, easily done with the simplest equipment and technique.

The basic photographic equipment necessary for black-and-white pictures is easy to obtain. An ordinary roll film camera (f/8 or faster), some fast film, and a tripod are all that is necessary. To trace hand motion, a penlight or flashlight bulb wired to a transformer is taped to the operator's hand. Time exposures of about two seconds are made on a film such as Kodak Super-XX Panchromatic Film while the motion is performed. The diaphragm can be set at f/8 with low room lights (approximately 3 foot-candles). This permits the operator to observe the workplace and the camera records the motion of the operator's hand.

To illustrate the results obtainable from this technique, three motions have been selected from the "reach" table of methods time measurement. There are three cases under which the "reach" basic motion can be performed. It is necessary to understand clearly each case before one can consider himself capable of applying that basic motion.

Let us see why the "Reach" definitions vary and consequently cause different time values for a "Reach" to the same distance: Case A is different from B and C because of its automatism (almost unconscious repetition of movement to a fixed location); Case C is dissimilar from B and A because in it "search and select" are prevalent. All of these relationships are much more obvious and convincing when seen as actual motion-light patterns in a photograph. Following are detailed explanations of the three "Reach" Cases:

Case A REACH:

Notice the motion-light path and movement of the head. This is the fastest motion of the three cases in question. To see this more clearly, compare the motion-light pattern of Case A against B and C, as follows:

a. The motion-light path of A is flatter.
b. The head and eyes in A are not used as much.
c. The curve patch is smoother than in Case C.

Case B REACH:

This is the next fastest of the three cases under comparison. Again, let us analyze the motion-light patterns to determine the reason:

a. The arc in Case B is larger than in A.
b. The eyes and head show more movement than in A.
c. The curve path is again smoother than in C.

Case C REACH:

The reason this motion takes longer than the other two cases is basically that it requires "search and select," as can be observed in the motion-light pattern as a disrupted arc.

The above specific points must be understood by anyone learning the basic motion "Reach," as must the details of all motion patterns. And the understanding of motion patterns is more easily accomplished through observation of motion-light pattern photographs. One of the most difficult elements of the Methods Time Measurement procedure is recognizing and applying motions performed simultaneously by two or more body members. The motion-light pattern pictures make the instruction much easier, as the following illustrations prove. The first picture shows a simultaneous "Move" Case C traveling to the outer part of the work area.

In comparing the two examples below, note that although they are performed in the same manner - over like distances - the outward movement takes longer. The arc of the outward movement is not as smooth and the eyes and head must be employed to perform the cycle. When a simultaneous "Move" is performed inwardly the eyes can span the area into which the parts are placed, with little or no movement.

On the other hand, an outward motion is not

Simultaneous Outward Movement.

Simultaneous Inward Movement.

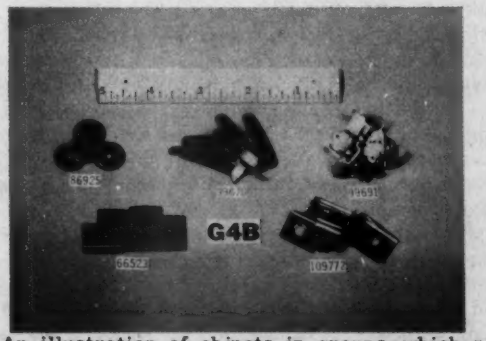
completely simultaneous: the parts are moved outward in unison, but while the eyes are assuring proper placement of one part with one hand, the other hand must hesitate approximately over the area into which it will eventually be placed. Thus a disruption of the smooth arc of the left hand is created, as seen in the outward movement photograph. The time required to "Move" outward, compared with the time to "Move" inward differs by the distance the eyes must travel. Note how easily these facts are proved by comparison of the two pictures.

Another difficulty in achieving a good understanding and consistency is in the use of tables which show very slight finger movement, such as "Grasp" and "Position." The motion-light pattern technique does not lend itself to these basic motions; but in such cases, actual close-up photographs of examples can be of great assistance. These pictures can be taken with the basic roll film camera-tripod setup, with only a close-up attachment added. Such "product portraits" are not so much a help in understanding definitions as they are in providing visual aids for proper classification.

Close-up pictures of your product bring association and comparison much closer to home. Photographs of either a single object or groups can be taken, to show correct classification. As shown in the following illustrations, a ruler enables rapid size comparison, and part numbers further classify the picture elements. Such pictures as these can easily be expanded to include other classification examples at any later time, and formed into a reference catalog.

In training several individuals, black-and-white prints or enlargements of pictures, taken as above, may be conveniently used. With larger groups, 135 Kodachrome slides are very useful and permit everyone to observe the colored illustration at the same time.

An illustration of the grasp of an object by itself which is easily grasped.



An illustration of objects in groups which require search and select in grasping.

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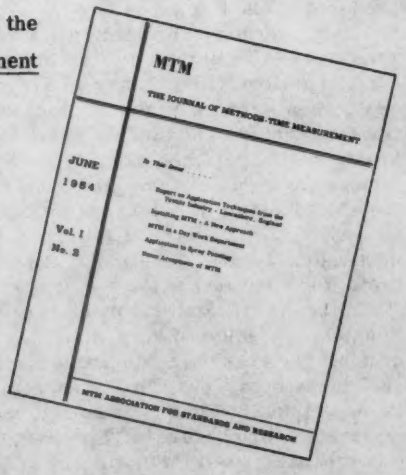

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APPLICATION

WHAT MANAGEMENT WANTED FROM MTM

J. I. McASKILL

Reprinted from the Second Annual International MTM Conference PROCEEDINGS, October, 1953.

I am going to tell you of our experiences in applying MTM, one of the newest of industrial management techniques to one of the oldest of industrial processes. This paper will tell what we expected from MTM, and what we actually achieved through its application to the making of clay tile.

Floor and wall tiles, together with other products of fired clay were produced in a very early period of the industrial history of mankind. Fired clay objects are usually among the articles discovered by Archaeologists in the ruins of ancient civilizations. There is ample evidence that the early builders in the Nile Valley and the Tigris-Euphrates Basin were familiar with the superior qualities of fired clay as a medium of surface covering. They used it extensively in their work. The famous doorway of blue glazed tile found in the stepped pyramid of Sakkara, built about 4155 B.C., the decorations of the processional street of Babylon, the famed Archers and Lions friezes from the palace of Darius at Susa, all attest to the antiquity of ceramic art and the technical competence of the ancient ceramists.

The art of tile production in Europe was advanced greatly by the Persians. It is to Saracenic Persia that the world largely owes the preservation and development of the art during the medieval and Renaissance periods. It is said that the course of Saracen conquests can be traced by the glazed and decorated wall tiling of their buildings. Many of the tiles produced during those periods still adorn the ancient mosques and shrines of Bagdad and Damascus. The Saracens introduced glazed tile into Spain and the Moorish influence is still reflected in tile produced by the Spaniards.

Italy, Germany, Holland and England have all produced tile from the earliest times.

The modern tile industry in England dates from 1830, when Herbert Minton of Stoke-on-Trent began tile manufacture. Minton's accomplishments in this branch of the ceramic industry made his business famous throughout the world. Some of the floors in the United States Capitol are surfaced with Minton tiles. The tile industry of Japan although more recent, dates back to 1879, when the Fujimiyaki tile works were founded at Nagoya.

In the United States output prior to the Revolution was sporadic and very limited. The most successful early attempt at production was made in 1867 by Samuel Keys, an Englishman, who started to experiment with the manufacture of tile while managing a brickworks at Pittsburgh. By 1871 he was producing good floor tile and in 1876 the Pittsburgh Encaustic Tile Company Limited was started.

Elaborate displays of European tile at the Centennial Exposition at Philadelphia in 1876 greatly stimulated interest in tile manufacture. Plants were soon opened at Trenton, N.J., Brooklyn, N.Y., Chicago, Ill., Beaver Falls, Pa., Boston, Mass., and several other places.

In Canada the first tile manufacturer was our company, the Frontenac Floor & Wall Tile Company. We started business in 1914, and aside from a few years during the first world war we have been in operation ever since.

This brief historical record sketches the background of a very old industry. From this history you will be better able to understand the causes of economic pressures in the tile industry.

Because of the widespread occurrence of the raw materials and the comparative simplicity of manufacturing methods, tiles are produced in many countries in large quantities.

Direct labour represents a very large proportion of the total cost of manufacturing. Countries with depressed currencies and low standards of living are able to produce tiles cheaply. This leads to very large exports of tiles, from England, European countries and from Japan. These exports are particularly valuable when earning dollars in Canada and the United States. Because tile is low in bulk and high in weight it can be shipped as ballast in boats leaving Europe and the Orient for East and West coast ports. These circumstances in the Canadian tile industry explain the economic pressures that were building up, prior to World War II. Following the war, by 1948, the Canadian tile industry was again subjected to heavy foreign competition from Europe and Japan.

In 1947, our Company's employees were organized by the United Electrical Radio and Machine Workers of America. After five successive contracts we found ourselves caught in the squeeze of rapidly rising wage rates and falling prices, with little or no increase in productivity. By means of mechanical improvements, automatic pressing, the use of conveyors and the simplification of clay preparation, we succeeded in keeping our heads above water and partially meeting union wage demands.

However, in 1950 the British devalued the pound sterling and overnight this action reduced the tile prices of our principal competitors by twenty-five percent. Inflationary pressures in Canada and the United States were steadily driving the cost-of-living higher. The outbreak of the Korean war brought still more inflation. This led to union demands which we could not meet.

Finally, on March 20th, 1952, our employees took strike action to enforce their claims. This strike lasted five months and on September 20th was finally settled.

One of the terms of settlement read as follows:

"The parties agree that within four months from the date of the signing of the contract, there shall be implemented an incentive system applicable to the greatest possible number of employees.

The parties shall commence immediate discussions on the type of incentive plan to be instituted and shall meet on whatever occasions are deemed necessary by either party, with a view to arriving at a mutually agreeable incentive plan within the four months stipulated above."

This culminated many attempts by the management of our company to introduce some form of profit sharing or wage incentive. We hoped this would increase our productivity per wage dollar spent, and improve employee earnings. Every effort was opposed by the Union. Strangely, as final settlement was reached, the union pressed hard for an early installation of incentives. They requested that a penalty of ten cents per hour be imposed on the company if the incentive system were not fully operative within four months. This request was refused by the management. However, we did promise to make a speedy installation of an incentive system. Obviously this was in the best interests of everyone concerned. This is the history that led us to engage the firm of Stevenson & Kellogg Limited, Toronto, Ontario, to install an incentive system in our plant. Through Stevenson & Kellogg we were introduced to Methods-Time-Measurement which proved to be most useful in finding the answers to our problem.

WHAT DID WE WANT FROM MTM?

1. We hoped for reduced labour cost through improved methods and incentive work.
2. We wanted increased take-home pay for our employees.
3. We looked for the maximum use of our existing equipment.
4. We wanted a speedy installation of the promised incentive system. We had urgent need of the benefits of incentive work.

HOW WE PUT MTM TO WORK

Selling the incentive system proved to be a difficult job. A great deal of patience finally succeeded in establishing agreement. It took three and one-half months of eleven formal meetings and innumerable informal discussions, to finally get the first department started on incentive rates.

There were many difficult points upon which to reach agreement. One was the union's fear of "speedup." Unions always fear speedup and perhaps they have had good reason to do so in the past. Here is a record of an early speedup in the ceramic industry, that led to the strike of the Hebrew brick makers in Egypt about 1500 B.C. In those days bricks were made from clay and straw. Apparently when the standards were set straw was provided. However Pharaoh decided that he would make a methods change involving more work but with no reduction in required output.

HOLY BIBLE
EXODUS, V. VERSES 6 TO 8

6. And Pharaoh commanded the same day the task masters of the people, and their officers, saying,
7. Ye shall no more give the people straw to make brick, as heretofore; let them go and gather straw for themselves.
8. And the tale of the bricks, which they did make heretofore, ye shall lay upon them; ye shall not diminish ought thereof for they be idle.

The result of this speedup was that for this and other reasons the first labour leader, Moses, led his people out of Egypt into the promised land. I believe it is fairly well recognized that the pace in most daywork shops is approximately 80 percent of the MTM, average performance. We quite frankly pointed this out to our Union committee. They found this difficult to swallow.

The union urged strenuously that the normal rate of production for the four months prior to the strike should be used as a base. This idea the company could not digest. Another difficult point upon which to reach agreement was caused by the union's desire to protect the less efficient workers. Also the union feared rate cutting once standards were set. Also the union refused to endorse MTM as a method to set rates. In addition the union desired one-hundred percent coverage in a very short time. All this made agreement difficult.

Management wished to achieve agreement on a number of points to which the union was opposed. Management wanted to make it abundantly clear that base rates were the only rates payable for unmeasured work. We could not accept department averages, nor group averages, nor previous average earnings. We wanted to clearly define the meaning of the terms METHOD & MOTION PATTERN. In order to overcome creeping change problems in standards, it was desirable to reach agreement that when method change exceeded five percent, the elements so altered could be reset and rates corrected. We wished to get a strong clause defining, "acceptable performance," which would clearly state how to deal with operators not reaching standard after a reasonable trial period. It was desir-

able to spell out in detail allowance clauses, for delays and off-standard conditions. We were determined to obtain a final disposition of all standards grievances through a Board of Arbitration advised by a technically qualified engineer. In spite of all this divergence of opinion we finally evolved an incentive contract containing the following basic points.

(1) A clear statement that negotiated base rates applied on all unmeasured work.
(2) A time standard guarantee clause.
(3) An acceptable performance clause, which stated, that continual failure to meet standards would not be tolerated.
(4) A good clause for settling grievances through a technically qualified arbitrator.

While negotiating we continued to prepare for the installation of the rates. Two of our men were trained on a three weeks MTM course. We offered to train a union man as a time-study Steward. The union refused. They felt that it was too big a responsibility to make any one union man a time-study Steward.

An appreciation course in MTM was given to all our foremen and three union Stewards. Studies were completed in one department and when agreement was finally reached the methods changes were made and rates posted. The system was under way.

As a further inducement a "slide off" was arranged which gave a twenty-five percent allowance on standards for the first week and which was reduced to a five percent allowance by the fourth week. This put all operators on their own in the fifth week. The results were most gratifying. Things happened we never believed possible. To illustrate here are a few actual cases. On many presses our productivity increased by more than 60 percent and we were able to reduce the number of people per press. On a large press we changed the operating crew from one man and a girl, to a one man operation and achieved a larger output. On several machines operating crews were reduced from two men to one man. Operating three tunnel kilns, using a conveyor to feed two of them, we first removed the conveyor. Then we changed to palletized handling and loaded around the clock on incentive. On this one group of operations, we reduced labour per twenty-four hours from 16 man shifts to 8 man shifts.

Our results to date have reduced our working force by 40 percent and increased hourly wages by 33 percent. This consisted of a 13 percent base rate increase and 20 percent increase due to incentives.

WHAT DID WE GET FROM MTM?

We got what we wanted. We got a substantial reduction in labour cost. An average increase in take-home pay of 33 cents per hour. An efficient utilization of our existing equipment. We now have stand-by machines, whereas formerly we often needed additional machines. We got a speedy installation of incentive in our plant. We had the bulk of the work completed and in operation within seven months. This, in spite of a two month delay due to negotiations with our union. Here are a few "Don'ts," to consider when installing MTM incentive system.

Don't worry about lack of union approval of MTM. Our union refused to have even the word "MTM" in the contract. However, the *method* of setting standards did not seem important. The important thing to the union was always - "What output is required by the standards?" *Don't* promise that every job and every worker will be on incentive by an early date. Some rates are hard to set, particularly for indirect workers.

Here are a few Do's and a bit of free advice

Do get the help of consulting engineers. You can't install MTM alone. *Do* negotiate a detailed and complete incentive contract. *Do* insist under grievance procedure that final settlement of standards disputes must be by arbitration. Insist also, that the chairman of the arbitration board must be technically qualified to deal with work standards. Failing this try to get a technically qualified adviser for the arbitration board chairman. We have found in James F. Lincoln's book, "Incentive Management" three rules worth following: These are,

"(1) Develop the best obtainable method of doing the job and set a proper price on that method.
(2) When the price is set, regard it as a contract that cannot be changed by management no matter what happens to earnings.
(3) The worker must guarantee his work."

WHAT DID MANAGEMENT WANT FROM MTM?

Management was seeking reduced costs, better wages for our employees and maximum use of our machines. We needed these improvements quickly to satisfy our employees and to meet the pressure of falling prices and rising wages. MTM was the answer. It gave us what we wanted. In addition we gained knowledge of an engineering technique Methods-Time-Measurement. This knowledge of MTM will continue to help us find profits and satisfactory wages through improved methods and dependable standards.

THE FOLLOWING ANALYSIS IS PRESENTED AS AN APPLICATION OF MTM TO INSPECTION AND PACKING

PART NAME Cover PART NO. _____ DEPT. 138

OPERATION NAME inspect and pack OPER. NO. 716 DATE _____

ANALYST: C.G.D. APPROVED: _____

ACTIVITY _____ PER _____

EQUIPMENT: Roller Conveyor Fiber Packing Boxes with attached Canvas Liners (See Photos)

TOOLS: None

MATERIALS: Painted Black (Steel) (formed)

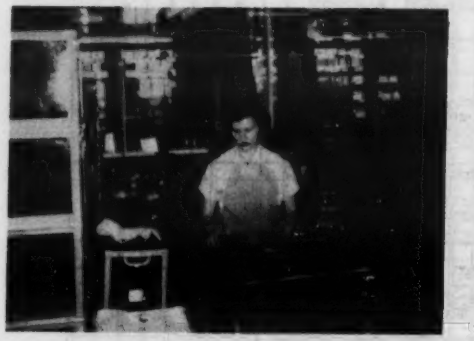
MTL. HANDLING: _____

SAFETY: _____

QUALITY: 10% Inspection or two per tray. If first two inspected are defective, whole tray is to be inspected 100%.

RELATED ANALYSES: _____

REMARKS: _____



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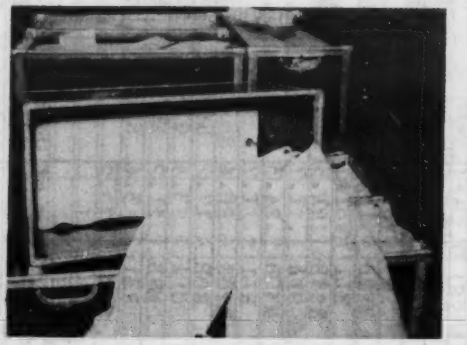
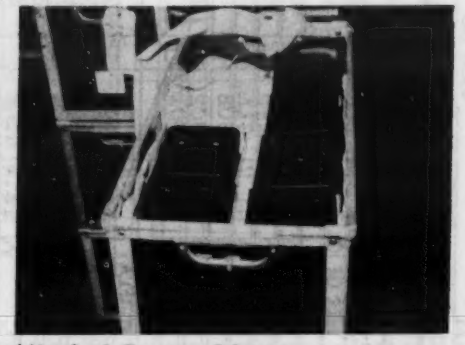




Fiber Packing Boxes with Attached Canvas Liners

ELEMENT	DESCRIPTION	TMU REQUIRED	LEVELED TIME	% ALLOWANCE	TIME PLUS ALLOWANCE	OCC. PER CYCLE	TOTAL TIME REQ.
A.	Get packing box and prepare	472.2					
B.	Get tray of covers	1138.0					
C.	Inspect and pack	1958.0					
D.	Place canvas dividers	1618.8					
E.	Write tag	279.7					
F.	Insert tag and aside box	88.7					
G.	Move out empty truck and move in loaded truck	99.3					
H.	Aside rejected covers	747.0					
ALLOWED TIME	TOTALS	6401.7	.06401	115	.073620	1/80	.000920

FORM NO. MTM-4

SHEET 1 OF 4 SHEETS

MTM ELEMENT ANALYSIS

PART Cover 16-0223 PART NO. _____ DEPT. _____
OPERATION Inspect and Pack Painted Covers DATE 3-5-54

DESCRIPTION — LEFT HAND	*	MOTION	TMU	MOTION	*	DESCRIPTION — RIGHT HAND
(A) Get Packing Box and Prepare						
			37.2	TBC2		Turn 180°
			18.6	TBC1		
			45.0	W3P		Walk 3 paces
			21.5	R24B		Reach 24"
			1.7	G1A		Grasp box
			24.3	M30B		Lift box
			37.2	TBC2		Turn 180°
			18.6	TBC1		
Reach to other end of box		R12B	12.9			
Grasp box		G1A	1.7			
Move 12"		M12B	13.4	M12B		Move 12"
Set on conveyor		P1SSE	9.1	P1SSE		Set on conveyor
Release box		(RL1)	45.0	W3P		Push box to work station
			1.7	RL1		Release box
			14.4	R14B		Reach to bottom of box 12"
			1.7	G1A		Grasp canvas liners
			5.6	G2		Regrasp liners
			27.1	M30A		Raise liners and move to L.H.
Grasp liners		G3	5.6			
Move liners to clear		M12B	13.4			
Release liners		RL1	1.7			
Reach to bottom of box		R24B	21.5	(R20E)		Move hand toward liner.
Grasp one liner		G1A	1.7			
Raise liner 135° arc		M30B	24.3			
Release liner to clear		RL1	1.7			
Reach toward bottom liner		R26E	20.4			
Reach to bottom liner	2	R6B	17.2	R6B		Reach to bottom liner
Grasp liner	2	G1A	3.4	G1A		Grasp liner
Move liner to fit bottom	2	M8B	21.2	M8B		Move liner to fit bottom
Release liner	2	RL1	3.4	RL1		Release liner
			472.2			
	(B)	Get Tray of	Covers			
	9		167.4	TBC1		Turn 90°
Reach to tray of nine	9	R16B	141.4	R16B		Reach to tray of nine
Grasp tray	9	G1A	15.3	G1A		Grasp tray
Remove tray from truck	9	M24B	185.4	M24B		Remove tray from truck
			167.4	TBC1		Turn 90°
Move front end of tray to stand	9	M16B	142.2	M16B		Move front end of tray to stand
Push tray in place	9	W1P	135.0	W1P		Push tray in place
Release tray	9	RL1	68.0	RL1		Release tray
Reach to cover	9	R12B	116.1	R12B		Reach to cover
			1138.0			

* = LIMITING MOTION

MTM ELEMENT ANALYSIS

PART Cover PART NO. DEPT.
OPERATION DATE

	(C)	Inspect	and Pack			
Grasp cover	40	G1A	68.0	G1A		Grasp cover
Move toward self	40	M12B	536.0	M12B		Move toward self
Inspect cover		EF		EF		Inspect cover
Move together to next	40	M6C	388.0	M6C		Move together to next
Position together	40	P1SSE	364.0	P1SSE		Position together
Release cover	40	RL1	68.0	RL1		Release cover
	40		102.0	M24C		Move the two covers to box
	40		364.0	P1SSE		Place two in box
	40		68.0	RL1		Release covers
			1958.0			
	(D)	Place	Canvas/	Dividers		
Reach to cover	31	(R16B)	675.8	R26B		Reach to cover
Reach to canvas	10	R20B	186.0			
Grasp canvas divider	10	G1A	17.0			
Regrasp divider	10	G2	56.0			
Move toward R.H.	10	M20B	182.0	(R20A)		Reach to divider
			17.0	G1A		Grasp divider.
Move to layer of covers.	10	M26B	218.0	M26B		Move to layer of covers.
Dptref canvas to cover parts	30	M6B	267.0	M6B		Spread canvas to cover parts
			1618.8			
		(E)	Write	Tag		
Reach to pg.		R24B	21.5	(R20B)		Reach to pencil behind ear.
Grasp tag.		G1A	1.7			
Regrasp tag.	2	G2	11.2			
Move tag to writing position.		R16B	15.8	(G1A)		Grasp pencil.
Regrasp tag.		G2	5.6	G2		Regrasp pencil
			8.9	M6B		Move pencil to paper.
			1.7	M1C		
			5.6	P1SE		Write "1".
			1.7	M1B		
			1.7	M1C		
			5.6	P1SE		Write "6".
			1.7	M1B		
			1.7	M1B		
			1.7	M1C		
			5.6	P1SE		Write "_". 16-0223
			1.7	M1B		
			1.7	M1C		
			5.6	P1SE		Write "0".
			1.7	M1B		
			1.7	M1B		
			3.4	M1C	2	
			11.2	P1SE	2	
			3.4	M1B	2	Write "2" twice.
			3.4	M1B	2	
			11.2	P1SE	2	
			3.4	M1B	2	

* — LIMITING MOTION

SHEET 2 OF 4 SHEET

MTM ELEMENT ANALYSIS

PART Cover PART NO. _____ DEPT. _____
OPERATION _____ DATE _____

DESCRIPTION — LEFT HAND	*	MOTION	TMU	MOTION	*	DESCRIPTION — RIGHT HAND	
			1.7	M1C			
			5.6	P1SE			
			1.7	M1B		Write "3".	
			1.7	M1B			16-0223
			5.6	P1SE			
			1.7	M1B			
			1.7	M1B			
			11.9	M1B	7	Write "B".	
			16.8	P1SE	3		
			5.1	M1B	3	Write "1".	
			11.2	P1SE	2		
			6.8	M1B	4		
			11.2	P1SE	2	Write "a".	Black
			5.1	M1B	3		
			5.6	P1SE	1	Write "c".	
			8.5	M1B	5		
			11.2	P1SE	2	Write "k".	
			10.2	M1B	6		
			5.6	P1SE	1	Write "8".	
			5.1	M1B	3		"80"
			5.6	P1SE	1	Write "0".	
			279.7				
(F) Insert Tag and Aside Box.							
Move tag toward box.		(M12B)	19.4	M22B		Move pencil to ear.	
			1.7	RL1		Release pencil.	
			9.6	R12A		Reach to tag.	
			1.7	G1A		Grasp end of tag.	
Move tag to retainer on box.		M14C	16.9	M14C		Move tag to retainer on box.	
Position tag in retainer.		P1NSE	10.4	P1NSE		Position tag in retainer.	
Push down to seat.		M2A	3.6	M2A		Push down to seat.	
Release tag.		RL1	1.7	RL1		Release tag.	
Reach to top edge of box.		R6B	8.6				
Grasp box.		G1A	1.7				
Push box down conveyer.		M12B	13.4				
			88.7				
(G) Move Empty Truck Out and Get Loaded Truck							
						Turn to truck 90°.	
Reach to truck.		R12B	4.8	R12F	37	Reach to truck.	
Grasp truck.		G1A	.6	G1A	37	Grasp truck.	
			27.8	W5P	37	Push truck aside.	
Release truck.		RL1	.6	RL1	37	Release truck.	
						Turn body 90°.	
			11.1	W2P	37	Walk to loaded truck.	
Reach to truck.		R12B	4.8	R12B	37	Reach to truck.	
Grasp truck.		G1A	.6	G1A	37	Grasp truck.	
			22.2	W4P	37	Push truck to station.	
Release truck.		RL1	.6	RL1	37	Release truck.	
			15.1	SS18C2		Side step 18".	
			11.1	W2P		Walk to working place.	
			93.3				

* = LIMITING MOTION

SHEET 3 OF 4 SHEET

MTM ELEMENT ANALYSIS

PART Cover PART NO. _____ DEPT. _____
OPERATION _____ DATE _____

DESCRIPTION — LEFT HAND	*	MOTION	TMU	MOTION	*	DESCRIPTION — RIGHT HAND
	(H)	Aside	Rejected Covers			
Reach to cover.	10	R12B	115.0			
Grasp cover.	10	G1A	17.0			
Move toward self.	10	M12B	134.0			
Inspect cover.		~~M~~F				
Aside to tray of rejects on truck.	10	M24C	255.0			
Place in row on tray.	10	P1SSE	91.0			
Release cover.	10	RL1	17.0			
Move hand back.	10	R12E	118.0			
			747.0			
			6401.7	Total TMU's		

*—LIMITING MOTION

SHEET 2 OF 4 SHEET

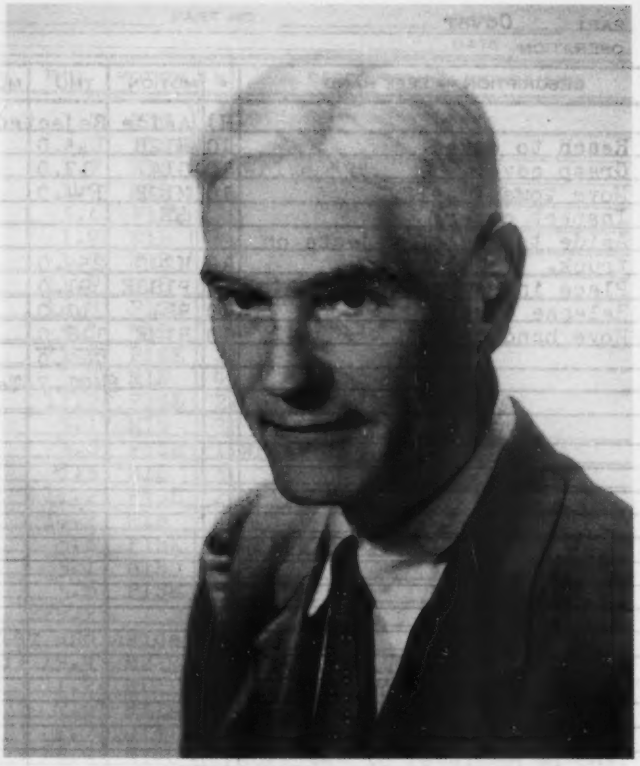
MTM NEWS

Mr. J. Carlton Ward, Jr., President of the Vitro Corporation of America will address the Third Annual International MTM Conference at a dinner meeting Thursday October 7 in New York City. The subject of Mr. Ward's talk will be "Management in the Atomic Age."

Mr. Ward has had exceptional experience in the field of atomic energy as well as other industrial areas. He is also well-known in the management field of the aircraft industry and has acted as consultant for many government air services.

Mr. Ward is a life member of the American Society of Mechanical Engineers, a member of the Society of Automotive Engineers, and a member of the Institute of Aeronautical Sciences.

The MTM Association is honored to have Mr. J. Carlton Ward, Jr. appear on the conference program.



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PRESIDENT'S REPORT

MONTREAL CHAPTER, M.T.M. ASSOCIATION FOR STANDARDS AND RESEARCH

FIRST ANNUAL GENERAL MEETING JUNE 16, 1954

This is the first annual report issued by a Montreal Chapter President since the inclusion of our group within the National Association. I think that at this time we would be rather remiss if we did not look back upon the past several years and recall the steps and phases through which this group has progressed. Three years ago, upon the invitation of Mr. Paul Kellogg, a group of qualified MTM graduates assembled at the offices of Stevenson & Kellogg Ltd. at that time in the Sun Life Building. Mr. Kellogg, in introducing the theme behind this assembly, indicated that there had been so much independent expression by certain graduates towards associating on the common grounds of MTM that he had taken this step in bringing together as many of the trained men who could be mustered throughout the district. He indicated quite emphatically that any organized group which arose from this initial get-together would function independently of professional consultants, be self-sustaining with its own committees and generally carry out programs which appealed to the membership body. Mr. Marcel Manseau was appointed at that time to act as advisor on technical matters and fill an ex-officio posting upon any committee elected. The enthusiasm created amongst that original gathering has continued. At the outset a voluntary committee was set up from amongst the attending group. This original committee consisted of Mr. Steve Dembicki of the C.I.L., Program Director, Mr. Grant Norcross of Dominion Rubber Co., Membership, Mr. Robert Noel-Bentley of E. B. Eddy Co., Mr. Frank Dooner of R.C.A. Victor Company, Secretary and Mr. J. A. B. Briggs of Shipping Containers Ltd., Treasurer.

Stevenson & Kellogg Ltd. continued to afford us the privilege of using their premises for the monthly meetings even after they transferred their operations to Westmount. During this span of time there had always been much discussion of affiliating with the National Association as a recognized chapter. Amongst the active group there were factions both

for and against. During the 1952 period the consulting firm of Leetham, Simpson Ltd. was appointed a further appointee for MTM training in the area and the ranks of our group were strengthened by more graduates. The growth of the membership body brought further incentive to organize the official chapter with the result that in May 1953 the unanimous motion by the quorum was passed and steps set up to take the formal action. This was done and since that time we have received voluminous reports, agendas and notifications from the parent body which up till then had not been forthcoming.

As we look to the future we should not lose sight of this origin and foster the ideas and principles which we have incorporated into our constitutions and by-laws thereby perpetuating both our own and industry's acceptance of this technique.

Under the new constitutions of the Montreal Chapter and in accordance with procedure a general election was held to elect a directorate of eight. Four new persons were added to those holding office at that time. The executive body elected were Messrs. Robert Noel-Bentley, E. B. Eddy Company; J. A. B. Briggs, Shipping Containers Limited; Frank Dooner, R. C. A. Victor Company; John Molson, Dominion Rubber Company; Donald Barwick, Barwick and Sons Limited; Robert Aston, Sorel Industries Limited; Thomas Cathcart, Canadian Arsenals; G. Y. Hamilton, Canadian Car and Foundry Company was appointed Secretary as per constitution.

During the year very productive executive meetings were held in the offices of Shipping Containers Limited. Details for the monthly meetings were arranged. Mr. Barwick provided the Chapter with the excellent letter-heads and envelopes. The attendance at those directors meetings averaged four members and the secretary attended all. Major issues mentioned hereafter were discussed and steps recommended for adoption by the general assembly.

Meeting Room

The transfer of the meeting from the office of Stevenson & Kellogg, Ltd., Sherbrooke Street W. to the Mechanics Institute, Atwater Avenue, followed through satisfactorily. The Chapter wishes to express its thanks and appreciation for the past goodness of that firm for affording the members the opportunity to congregate during the important phase of its organization in spite of congestion at their premises.

Meetings

Monthly meetings held at the Mechanics Institute proved to be attractive and thought provoking. Interesting demonstrations and analyses were provided by members from the floor to handle and explain their problems and topics with clarity and gain experience in addressing groups of critical conferees on technical matters. This practice is to be encouraged. It was found that in some instances the interest created extended the meeting beyond the prearranged time with the Institute and, thanks to Mr. Hennessy, the caretaker, we were able to close in harmony without disruption to our relations with the Institute.

Annual Conference

Mr. Briggs and Mr. Hamilton participated in the Introductory session at the Hotel Statler in New York on October 6th, 1953. They both attended National Chapter meetings and offered constructive suggestions to other centres who contemplated organizing chapters. Their participation at the conference and their attendances at the chapter meetings no doubt resulted in the honor preferred upon the Montreal Chapter by the National Association in appointing it the Introductory Session Chapter for the National Conference in October, 1954. This invitation was discussed by the directorate and subsequently submitted to open quorum of membership for acceptance; this proved unanimous and has been accepted by the National Association executives. A meeting is being held in New York tomorrow to discuss further arrangements. Contacts with Mr. W. Thompson, Argus Cameras, Ann Arbor, Michigan, have been conducted by phone with confirming correspondence being sent by the Secretary. It is urged that every member make it a point to support this effort with personal attendance and participation.

Conclusion

In closing this report I wish to pay a personal tribute to the Directorate who have contributed their time and efforts towards furthering our Chapter. Distance has prevented full participation in the assemblies but those who have been working behind the scenes of the regular meetings have given you loyal representation and earnest direction. Mr. Hamilton has excelled in his performance of the responsibilities of Secretary and you may rest assured that his files and records are both accurate and bulky with more correspondence than we ever anticipated. To those of us who are now stepping down in favor of the newly elected four we have certain items which we pass on as unfinished; they can be assured of our continued and eager support as ordinary members. For their guidance I have listed hereunder the main items:

1. Revision of monthly meeting night is so desired by the membership.
2. Active participation in the New York Conference.
3. Letters to executives of representatives of companies enlisting their support.

4. Distribution and sales campaign of the Quarterly Journal.
5. Notification to the National Association of newly elected directors and appointees.

It is therefore my closing prayer that the Chapter continue in its endeavors to promote the welfare of MTM throughout our community and extend its membership to become an assistance to trained men, a help to managements and a further dynamic force in the future of our thriving Canadian Industrial Society.

Respectfully submitted,

J. A. B. Briggs
Shipping Containers Limited
155 Beaubien St., West
Montreal, Quebec, Canada

June 16, 1954

As a beginning step to help industry in the Florida area, the University of Florida and the General Extension Division of the University has decided to sponsor some initial activities in MTM.

A two-day MTM Clinic has been held in Jacksonville, Florida. Similar clinics are planned for Tampa and Miami.

* * * * * *

The Board of Directors of the MTM Association will hold its next meeting August 17 in New York City.

* * * * * *

ORDER BLANK – REMITTANCE SHOULD ACCOMPANY SMALL ORDERS

Reports	Quantity	Unit Price		Extensions
		Member	Non-member	
101 Disengage		.75	1.00	
102 Reading Operations		.50	.75	
104 Performance Rating System		.50	.75	
105 Simultaneous Motions		1.00	1.25	
106 Short Reaches and Moves		1.00	1.25	
Proceedings 1952 MTM Conference		2.00	2.00	
Proceedings 1953 MTM Conference		4.00	5.00	
Data Cards				
Detailed Paper				
Simplified (paper)				
			TOTAL	

NAME _____ PLEASE SEND BILL _____

POSITION _____ COMPANY _____ PAYMENT ENCLOSED _____

ADDRESS _____

Send order to: MTM Association for Standards and Research, 531 East Liberty Street, Ann Arbor, Mich.

Under the Auspices of the

MTM ASSOCIATION

the following members of The Montreal Chapter will participate:

F. J. DOONER, Supervisor
Home Instruments Components
Methods Group
R. C. A. Victor Company Limited

L. ST. JULIEN, Methods Analyst
Canadian Car and Foundry Company Limited

F. G. WHITE, Methods Engineer
Canadian Arsenals Limited
Filling Division

G. H. WEBB, Methods Analyst
Charles E. Frosst & Co., Ltd.

J. A. B. BRIGGS, Industrial Engineering Supervisor
Shipping Containers Limited

J. DAVIES, Methods Analyst
The E. B. Eddy Company

R. L. BUGBEE, Plant Manager
Alnee Wood Products, Inc.

D. C. BARWICK
Vice President & General Manager
Barwick & Son Limited

R. HEANEY, Methods Engineer
Canadian Arsenals Limited
Filling Division

J. ARCHAMBAULT, Plant Manager
Familex Products Limited

R. NOEL-BENTLEY, Standards and Methods Manager
The E. B. Eddy Company

G. Y. HAMILTON, Engineering Supervisor
Alnee Wood Products, Inc.

OCT. 6TH

MTM

introductory session

(For those not already trained who want to find out about MTM)

The MTM Introductory Session is being continued this year for those interested in learning about the fundamentals of this effective manufacturing tool.

If you are not familiar with MTM, a system of predetermined time found extremely useful for methods analysis, standard data development, plant layout, cost estimating, new equipment procurement, etc., take advantage of this Introductory Session.

Learn what MTM is, how MTM was developed, how you can become trained to apply MTM, and how you can use MTM to best advantage.

MTM practitioners from the Montreal Chapter of the Association will introduce you to MTM and present actual MTM application from representative industries.

For further information regarding either the MTM Introductory Session or Regular Conference Sessions write:

Executive Secretary
MTM Association for Standards & Research
531 East Liberty Street
Ann Arbor, Michigan

REGISTRATION FOR SPECIAL MTM INTRODUCTORY SESSION
October 6, 1954, Hotel Statler, New York, N. Y.

Name _____ Position _____

Organization _____

Address _____

City _____ State _____

Enclosed find check* for $ _____ for reservations indicated.

ONE DAY ONLY INTRODUCTORY

Indicate Number Reservations		MTM Association Member	Non Member
☐	Complete Introductory Session including luncheon	$18.00	$23.00

*Make checks payable and mail with registration to:
The MTM Association for Standards & Research
531 East Liberty Street
Ann Arbor, Michigan

See Page 2 for Registration for Regular Conference Sessions October 7 & 8

Please indicate below the type of operations you'd like to see represented in the demonstration at this special MTM introductory Session.

- ☐ Warehousing
- ☐ Heavy Machining
- ☐ Needle Trades
- ☐ Textiles
- ☐ Furniture

3rd annual international Methods—Time—

An Integrated Program of Presentations by Exp

THURSDAY, OCTOBER 7th

8:30 registration

morning sessions

Chairman: Edward L. Barnett, Plant Manager, Binks Manufacturing Company, Chicago, Illinois

9:30 assembly line techniques

William C. Thompson, Manager, Methods and Standards, Argus Cameras Inc., Ann Arbor, Mich.

11:00 application of MTM to office operations

Professor Harold E. Smalley, University of Connecticut, Storrs, Connecticut
Gerard Leahy, Manager, Methods Department, Sears, Roebuck and Company, Philadelphia, Pennsylvania

12:30 luncheon

Chairman: Dr. Charles B. Gordy, Director of MTM Research, University of Michigan, Ann Arbor, Michigan

complexity, research and industry

Professor Harry H. Goode, Director, Willow Run Research Center, University of Michigan, Ann Arbor, Michigan

afternoon sessions

Chairman: T. E. Arnold, Chief Industrial Engineer, The Kroger Company, Cincinnati, Ohio

2:00 MTM–key to workplace standardization in a precision job shop

Sydney M. S. Dunn, Chief Industrial Engineer, Pioneer-Central Division, Bendix Aviation, Davenport, Iowa

3:00 use of predetermined times in labor negotiations

Owen Fairweather, Seyfarth, Shaw and Fairweather, Chicago, Illinois

save these dates register today

THURSDAY OCT. 7TH

FRIDAY OCT. 8TH

The Second Annual MTM Conference Session
October 7th and 8th, 1954
Hotel Statler, New York, N. Y.

Name _____ Position _____

Organization _____

Address _____

City _____ State _____

Enclosed find check* for $_____ for reservations indicated

Indicate Number Reservations		MTM Association Member	Non Member
☐	Complete Conference (Sessions, luncheons, dinner & proceedings)	$30.00	$37.00
☐	All sessions (sessions, proceedings)	20.00	25.00
☐	Thursday Program (Thurs. sessions, luncheon, dinner)	22.00	25.00
☐	Friday Program (Fri. sessions, luncheon)	15.00	18.00
☐	Half-day sessions	8.00	10.00
☐	Luncheon separate	5.00	5.00
☐	Dinner separate	7.00	7.00
☐	Proceedings Only	4.00	5.00

*Make checks payable and mail with registration to: The MTM Association for Standards & Research
531 East Liberty Street
Ann Arbor, Michigan

See Reverse Side for Registration for Introductory Session—October 6th.

e--Measurement—conference

by Experienced Practitioners • HOTEL STATLER, NEW YORK, N.Y.

FRIDAY, OCTOBER 8th

8:30 registration

morning sessions

Chairman: James F. Biggane, Chief Industrial Engineer, The Maytag Company, Newton, Iowa

9:30 developing your MTM training program

D. W. Karger, Chief Plant and Industrial Engineer, The Magnavox Company, Fort Wayne, Ind.

11:00 research developments in moves with weights

David L. Raphael, Research Associate, University of Michigan, Ann Arbor, Michigan

12:30 luncheon

Chairman: Richard F. Stoll, Executive Secretary, MTM Association for Standards and Research, Ann Arbor, Michigan

Broad Acceptance of Uniform Labor Standards and the MTM Association

Seth L. Winslow, President, MTM Association for Standards and Research, Ann Arbor, Mich.

afternoon sessions

Chairman: Norman A. Dinnsen, Chief Industrial Engineer, Weston Electric Company, Newark, N. J.

2:00 concurrent panel sessions—MTM applications to

Chairman: Professor Harry J. Loberg, Director, Sibley School of Mechanical Engineering, Cornell University, Ithaca, New York

foundry operations

James R. Brauer, Chief Industrial Engineer, Sterling Steel Casting Company, East St. Louis, Ill.

warehousing

John S. Petro, Staff Industrial Engineer, Thompson Products, Inc., Cleveland, Ohio

heavy machining

Raymond M. Pratt, Supervisor, Industrial Engineering, York Corporation, York, Pennsylvania

needle trades

N. S. Bjork, Chief Industrial Engineer, Munsingwear, Inc., Minneapolis, Minnesota

textile

E. P. Willis, Chief Industrial Engineer, Textile Products Division, Owens-Corning Fiberglas Corp., New York, New York

furniture

William C. Banta, Supervisor, Methods and Standards, John Widdicomb Company Grand Rapids, Michigan

7:00 THURSDAY DINNER

MANAGEMENT IN THE ATOMIC AGE

J. Carlton Ward, Jr., President
Vitro Corporation of America, New York, New York

RESEARCH REPORTS

Disengage (Report 101)

This report contains a preliminary study of the element disengage. While it is still classified as tentative, the report contains some extremely interesting conclusions on the nature and theory of this element.

Reading Operations (Report 102)

The first step in the use of MTM for establishing reading time standards is contained in this report. In addition, the report contains a synopsis of the work done in this field by 11 leading authorities.

MTM Analysis of Performance Rating Systems (Report 104)

A talk presented at the SAM - ASME Time and Motion Study Conference, April 1952. It contains an analysis of performance rating systems and various performance Rating Films from an MTM standpoint.

Simultaneous Motions (Report 105)

This report represents almost two man-years' work on a study of Simultaneous Motions. It is a final report of the Simultaneous Motions project undertaken by the MTM Association. While it does not purport to provide complete and exhaustive answers to all problems in the field of Simultaneous Motions, it presents a great deal of new and valuable information which should be of interest to every MTM practitioner.

Short Reaches and Moves (Report 106)

This report contains an analysis of the characteristics of Reaches and Moves at very short distances. It develops important conclusions concerning the application of MTM to operations involving these short distance elements.

Research Methods Manual (Report 107)